IV Infiltration Detection using Non-Invasive Sensors

Technology #7207

A non-invasive system to detect the common and dangerous problem of IV Infiltration.

Background: IV infiltration is a common problem, where fluid enters surrounding tissue rather than the vein as intended. Infiltration occurs from issues such as solution tissue toxicity, vasoconstrictors, infusion pressure, and mechanically puncturing the lining of the vein. IV infiltration can result in medical emergencies, with the most critical aspect is timely detection. Currently infiltration is primarily detected by witnessing symptoms or by patients alerting medical staff. A detection system is needed when patients cannot notify medical staff of the symptoms, for example when under anesthesia or undergoing surgery. Early infiltration detection would also benefit neonatal and pediatric units, where complications are most severe and timely responses are of great necessity.

Technology: Georgia Tech inventors have developed a system and method for detecting IV infiltration. The non-invasive sensing modalities monitor for two responses that occur during infiltration: stretching of skin around the infiltration site, and the reduction in bioimpedance. In addition, the technology includes an algorithm for detecting the change of the patient’s physiology and an alert to medical staff. The incorporation of multiple modalities ensures both early detection and accurate identification for quick response time and treatment.

Potential Commercial Applications:

- Anywhere IVs are administered
- Hospitals, emergency rooms, surgery centers, doctors’ offices
- Greatly impact pediatric and neonatal populations most

Benefits/Advantages:

- Faster detection and treatment
- Inexpensive option
- Sensing modalities are sensitive to infiltration, regardless of administered fluid coloring
- Fusion of multiple modalities leads to higher accuracy and fewer false negatives in detection
- Detection would make IV caustic drug delivery safer

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